CAPILLARIID NEMATODES FROM SOUTH AUSTRALIAN FISH AND BIRDS

By T. HARVEY JOHNSTON and PATRICIA M. MAWSON

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The genus *Capillaria* is relatively poor in characters of taxonomic value, and though numerous species have been named, the descriptions of many are insufficient. In the present paper the main taxonomic features considered are: the ratio between the regions of the body, and the characters of the spicule, spicule sheath, bursa, vulva and eggs. Measurements given for eggs have been based on those nearest the vulva, since those further removed may show considerable variation in size and form.

Many helpful figures and descriptions were found in the papers published by Freitas and Lent (1935) and Heinze 1933) on species from fish; and Cram (1936), as well as Freitas and Almeida (1935) on species from birds. Types are being deposited in the South Australian Museum.

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HOST-PARASITE LIST

Fish

CALLIONYMUS CALAUROPOMUS Richardson—St. Vincent Gulf, Capillaria cooperi n. sp.

LATRIDOPSIS FORSTERI Castln.—Kangaroo Island, Capillaria latridopsis, n. sp. CANTHERINES HIPPOCREPIS—Glenelg, Capillaria cooperi n. sp.

Артусноткема ванкы Mull, and Henle (Rhinobatus phillipi of Waite's Hand-

book of the Fishes of South Australia)-Rapid Bay, Capillaria rhinobati n. sp.

BIRDS (all from the Tailem Bend district, Murray River)

PHALACROCORAX CARBO Linn.—Capillaria jaenschi n. sp.

PHALACROCORAX SULCIROSTRIS Brandt—Capillaria jaenschi n. sp.

PHALACROCORAX MELANOLEUCAS Vieill.—Capillaria jaenschi n. sp.

PHALACROCORAX FUSCESCENS Vieill.—Capillaria jaenschi n. sp.

PELECANUS CONSPICILLATUS Temm.—Capillaria jaenschi n. sp.

LARUS NOVAEHOLLANDIAE Stephens-Capillaria jaenschi n. sp.

CHLIDONIAS LEUCOPAREIA Temm.—Capillaria jaenschi n. sp.

CHENOPSIS ATRATA Lath.—Capillaria ellisi n. sp.

POMATOSTOMUS SUPERCILIOSUS Vig. and Horsf.—Capillaria pomatostomi n. sp. GRALLINA CYANOLEUCA Lath.—Capillaria grallinae n. sp.

Capillaria rhinobati n. sp.

Fig. 1-3

From Aptychotrema banksii, from Rapid Bay, collected by H. M. Cooper. The material consists of one broken male worm, a whole female, and several parts of females. The body bears ventrally a bacillary band which extends throughout the length of the body.

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The single complete female specimen is 20.4 mm. in length, with its oesophageal region 6.5 mm. long, or one-third of the body length. The posterior end terminates abruptly, and the anus is almost terminal. The body width at the anterior end is 7μ ; at the base of the oesophagus 52μ ; and at the widest part of the worm 80μ .

The vulva is just posterior to the oesophagus, and its position is made conspicuous by a flap formed by the intrusion of the end of the vagina. Eggs are



Fig. 1-8

Fig. 1-3—Capillaria rhinobati: 1, vulvar region; 2, egg; 3, male tail. Fig. 4-6 —Capillaria latridopsis: 4, anterior end of female; 5, egg; 6, male tail. Fig. 7-8— Capillaria cooperi: 7, vulvar region; 8, male tail. Fig. 2, 3, 5 and 7 to same scale; fig. 6 and 8 to same scale.

present in larger numbers than is usual in members of this genus; they are thinshelled and measure 19μ by 63μ .

The male specimen present is incomplete, consisting of an intestinal region 13.7 mm. long with a maximum width of 60μ and part of the oesophageal region (2.4 mm. in length) with a width of 54μ at the base of the oesophagus. The

spicule is 16 mm. long. A small bursa, containing five lobes of hypodermis, is present. The spicule sheath is not extruded, and spines are not discernible.

The appearance of the egg of this species is somewhat like that of C. helenae Layman 1930, and C. tomentosa (Dujardin). The species differs from the latter in having a smooth egg-shell, and from the former in total length and in the length of the spicules.

Capillaria latridopsis n. sp.

Fig. 4-6

From Latridopsis forsteri, Kangaroo Island, collected by S. Hurcombe. The material consists of a male and a female, both incomplete. The male piece, whose head is missing, measures 6.7 mm. long, of which the intestinal region occupies 2.8 mm. The female piece is 10.2 mm. in length and its oesophageal region 9.4 mm. The species is obviously one in which the length of the anterior end greatly exceeds that of the posterior. The configuration of the anterior end of the female is shown in fig. 4.

The body widths at different levels are, for males and females respectively, 55μ and 68μ at the posterior end of the oesophagus, and 63μ and 81μ at widest part of the worm. The width of the head in the female is 8μ .

The posterior end of the male is widened into two narrow lateral flanges which appear like caudal alae, but which are not continuous with the small bursa. The spicule is $\cdot 3$ mm. long. No spinous sheath was observed.

The position of the vulva in the female is marked by a flap of cuticle. The eggs are 25μ by 58μ , and each is enclosed in a capsule. The measurements agree with those of *C. brevispiculata* as given by Freitas and Lent 1935, but it differs in egg-shell. The species differs from *C. helenae* Layman in the ratio of the body parts.

Capillaria cooperi n. sp.

Fig. 7-8

From Callionymus calauropomus (St. Vincent Gulf; South Australian Museum material), type host, and Cantherines hippocrepis, from Glenelg, collected by H. M. Cooper. The material comprises numerous males and two females of a short stout species of Capillaria. The males are 4-5 mm. long, the females $5\cdot4-7\cdot9$ mm. long. The widths at various levels of the body are, for male and female respectively, 7μ and 10μ at the head, 45μ and 54μ at the base of the oesophagus, and 54μ and 63μ at the widest part of the intestinal region. The ratio of the length of oesophageal region to the total body length is 4:7 in the male, 5:7 in the female.

No bursa is present in the male, the cloaca opening ventrally near the tip of the tail. The spicule measures $\cdot 12$ mm. in length.

The vulva is simple, situated just posterior to the oesophagus. The eggs are 21μ by 54μ , their shells being very finely pitted.

The relation of the body parts agrees with C. *pterophylli* Heinze 1933, but the worm is shorter and stouter, and the shape of the egg is different.

Capillaria jaenschi n. sp.

Fig. 11-13

From Phalacrocorax sulcirostris (type host), P. fuscescens. P. carbo, P. melanoleucas, Pelecanus conspicillatus, Larus novaehollandiae and Chlidonias leucopareia, all from Tailem Bend. Capillaria sp. from Phalacrocorax fuscescens, Hobart, recorded by us in the B.A.N.Z.A.R.E. Report (1945), belongs to this species.

The worms are long slender Capillariids, recognisable by the structure of the egg and by the form of the male tail. The body bears two bacillary bands throughout its length.

Females 7.1-27.4 mm. long; the ratio of the oesophageal to the intestinal region, 1:1.1.1.3. The breadth of the body measured across the head is 7μ , at the base of the oesophagus $37-41\mu$, and at widest part $45-90\mu$. The cuticle around the vulva projects as a tubular flap. The eggs, $18-20\mu$ by $48-50\mu$, have coarsely pitted shells and prominent polar capsules.



Fig. 9-17

Fig. 9-10—Capillaria ellisi: 9, vulvar region; 10, male tail. Fig. 11-13—Capillaria jaenschi: 11, egg; 12, male tail; 13, spicule sheath. Fig. 14-16—Capillaria grallinae; 14, egg; 15, bursa; 16, male tail. Fig. 17—Capillaria pomatostomi, egg. Fig. 9 and 16 to same scale; all other figures to same scale.

The male, of which only one complete specimen is available, is 9.9 mm. in length, with a ratio of intestinal and oesophageal region 1:1.2. The breadth of the body across the head is 6μ , at the base of the oesophagus 36μ , and at the widest part 45μ . The spicule is .7 mm. long; the sheath extruded in one specimen bears six longitudinal ridges with convoluted edges. The bursa consists of a dorsal and two lateral lobes, quite distinct from one another; the dorsal being narrow and in lateral view appearing as a stout backwardly-directed hook.

The species is distinguishable from the widely distributed bird parasite C. contorta (Creplin) by the ratio of the body parts. It is distinguished from C. laricola Wassilkova by the ratio of the body parts in the female, as well as by the absence of spines on the spicule sheath in the male and by the smaller size of the eggs. Capillaria spp., hitherto recorded from Phalacrocorax spp., are C. carbonis (Rud.) (Europe), of which no description is given; C. appendiculata Freitas (Brazil), from which the present species differs in spicule length and egg size; and C. spiculata Freitas (Brazil), from which it differs in the shape of the egg and the bursa.

Capillaria ellisi n. sp.

Fig. 9-10

From the black swan, *Chenopsis atrata*, Tailem Bend.

The material consists of one female and one male, as well as several broken pieces of worms. The complete female is 15.9 mm. long, the ratio of the oeso-phageal to the intestinal region being 1:1. The body width at its widest part is 63μ , at the base of the oesophagus 40μ , and at the head 5μ .

The cuticle of the anterior vulvar lip projects as a flap. The eggs are smooth-shelled and measure 37μ by 51μ .

The male is 9.2 mm. long, the ratio of the oesophageal to the intestinal region being 1:1.4. The body width at the head is 5μ , at the base of oesophagus 34μ , and at the widest part of the worm 36μ . The spicule is 1.4 mm. long. A very spinose sheath is present (fig. 10). The cuticle on either side of the cloaca projects as two bursal flaps, each supporting a bilobed portion of the hypodermis.

The form of the spicule sheath of this species is very like that of C. contorta and C. triloba, but the species differ markedly in the ratios of the anterior and posterior body parts.

The only recorded species of Capillaria from a swan is C. droummondi Trav. 1915, a description of which is not available to us. It differs from C. anatis (Schrank) in the absence of a bacillary band.

Capillaria pomatostomi n. sp.

Fig. 17

From *Pomatostomus superciliosus*, from Elwomple, near Tailem Bend. Only female specimens are represented. They are $14 \cdot 4 - 15 \cdot 1$ mm. in length, the ratio of the anterior to the posterior parts of the body being $1:1\cdot 5 - 1\cdot 6$. The width at the head is 7μ , at the base of the oesophagus 45μ , and at their widest part 68μ . Bacillary bands were not observed. A small cuticular flap overhangs the anterior lip of the vulva. The eggs are smooth-shelled, more ovoid in form than most Capillariid eggs, and measure 28μ by $43-45\mu$.

Capillaria grallinae n. sp.

Fig. 14-16

From the peewhit, or "Murray Magpie," *Grallina cyanoleuca*. Numerous specimens were obtained at various times from this host species, all from Tailem Bend. The oesophageal region tapers markedly towards the head. A single wide bacillary band is present.

The female measures 10.4-16.6 mm. in length, the ratio of the anterior to the posterior body parts being 1:1.8 (1:1.3 in one specimen). The body width at the head is 9μ , at the base of the oesophagus $46-63\mu$, and the widest part 57-72 μ .

The vulva is inconspicuous. The egg-shell is spiny and measures $20-21\mu$ by $50-52\mu$.

The male measures $11-11\cdot 5$ mm. in length, the ratio of anterior to posterior body parts being $1:1\cdot 4$. The body width at the head is 7μ , at the base of the oesophagus $36-39\mu$, and at the widest part 54μ . The spicule is well chitinised and measures $\cdot 9-1$ mm. The spicule sheath is very strongly annulated.

The species is closest to *C. venteli* Freitas and Almeida, *C. graucalina* J. & M. and *C. emberizae* Yamaguti. The measurements agree with those given by Yamaguti for *C. emberizae*; the eggs of the latter species are described as "lemonshaped," and as no figure is given, nor any mention of the texture of the shell, comparison is difficult; the very wide variation in egg-size mentioned by Yamaguti suggests that unripe eggs were included in his measurements. In view of this uncertainty regarding the size and shape of the eggs, and of the wide difference in locality and host, we consider it wiser to name our species as new.

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